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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,142	12/31/2003	Anthony DiCarlo	TI-36187	7928

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EXAMINER
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VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/750,142

**Applicant(s)**

DICARLO ET AL.

**Examiner**

Lan Vinh

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-18 is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 22106.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 4-5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al (US 2004/0063595 A1)

Park discloses a method for stripping resist on a semiconductor device includes the step of removing pattern resist that remains after an etch of an underlying metal pattern that is supported by another layer/spacer layer (col 3, paragraph 0033). The method comprises the steps of:

cleaning a semiconductor substrate/wafer with a chemical wet cleaning/develop solution (col 6, paragraph 0066, col 6, paragraph 0070)

ashing the surface of the substrate (col 6, paragraph 0071)

removing the remaining photoresist pattern with a stripping composition after the cleaning and ashing step (col 6, paragraph 0072), which reads on photochemically removing the pattern resist that remains after the cleaning and ashing since the applicants discloses that photochemically removing comprises stripping using a solution in page 11 of the specification

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Regarding claims 4-5, Park discloses substantially removing the polymer residue/thread-type polymer/polymer skin from the photoresist pattern residue/hardened skin from the pattern (col 6, paragraph 0076)

Regarding claim 7, Park discloses forming a metallic patterned layer (col 6, paragraph 0070)

3. Claims 8, 11-12, 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al (US 2004/0063595 A1)

Park discloses a method for stripping resist on a semiconductor device includes the step of removing pattern resist that remains after an etch of an underlying metal pattern that is supported by another layer/spacer layer (col 3, paragraph 0033). The method comprises the steps of:

- depositing another layer /spacer layer between the metallic layer and the substrate (col 3, paragraph 0033)

- depositing a metal layer /material for the patterned layer (col 6, paragraph 0070)

- depositing a pattern resist layer, patterning the metal layer, etching the resist layer and the metal layer/patterned layer (col 6, paragraph 0070)

- cleaning a semiconductor substrate/wafer with a chemical wet cleaning/develop solution (col 6, paragraph 0066, col 6, paragraph 0070)

- ashing the surface of the substrate (col 6, paragraph 0071)

- removing the remaining photoresist pattern with a stripping composition after the cleaning and ashing step (col 6, paragraph 0072), which reads on photochemically

removing the pattern resist that remains after the cleaning and ashing since the applicants disclose that photochemically removing comprises stripping using a solution in page 11 of the specification

Regarding claims 11-12, Park discloses substantially removing the polymer residue/thread-type polymer/polymer skin from the photoresist pattern residue/hardened skin from the pattern (col 6, paragraph 0076)

Regarding claim 14, Park discloses forming a metallic patterned layer (col 6, paragraph 0070)

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3, 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US 2004/0063595 A1) in view of Chinn et al (US 2004/0053505A1)

Park method has been described above. Unlike the instant claimed inventions as per claims 3-4, 9-10, Park fails to specifically disclose that the wafer/semiconductor substrate is a micromechanical device/DMD wafer

Chinn, in a method for etching features, discloses that an etched silicon feature can be used in various MEMS/micromechanical devices (see abstract)

Hence, one skilled in the art at the time the invention was made would have found it obvious to employ Park etched structure as a micromechanical device in view of Chinn teaching because Chinn discloses that silicon structure can be used in a variety of MEMS applications, including MEMS in semiconductor device applications (col 6, paragraph 0066)

6. Claims 6, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US 2004/0063595 A1) in view of Nguyen et al (US 6,472,315)

Park method has been described above. Unlike the instant claimed inventions as per claims 6, 13, Park fails to specifically disclose performing the removing step with an acetate strip process

Nguyen discloses a method for fabricating an interconnect system comprises the step of removing a patterned photoresist with an acetate solution (col 5, lines 30-35)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Park method by performing the step of removing the photoresist with an acetate solution as per Nguyen because Nguyen discloses that the photoresist is essentially dissolved in a solution that includes ethylene acetate (col 5, lines 33-38)

***Allowable Subject Matter***

7. Claims 15-18 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 15, the cited prior art of record fails to disclose or suggest a method of forming a micromirror array comprises the step of "removing pattern ....ashing steps", in combination with the rest of the limitations of claim 15

***Response to Arguments***

8. Applicant's arguments with respect to the reference of Lee (US 6,296,988) have been considered but are moot in view of the new ground(s) of rejection. The applicants argue that Lee fails to teach or suggest photochemically removing the pattern resist that remains after the cleaning and ashing. This argument is moot in view of newly cited reference of Park (US 2004/0063595 A1) that discloses the step of removing the remaining photoresist pattern with a stripping composition after the cleaning and ashing step (col 6, paragraph 0072), which certainly reads on photochemically removing the pattern resist that remains after the cleaning and ashing, as required by amended claims 1 and 8

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



LV

March 17, 2006